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Build Connect: A Mobile Application for Vendor and Construction Material Supply Management

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Abstract - The construction industry often faces challenges related to communication between buyers and vendors, material supply delays, and inefficient logistics management. To address these problems, a mobile application named Build Connect is proposed and developed. The application provides a digital platform where buyers and vendors can interact directly for construction-related services such as material supply and vehicle booking. The system allows users to register, log in securely, browse vendor services, place orders, and track deliveries in real time. The application is developed using Java and XML for the front-end interface, while Firebase services are used for database management, authentication, and storage. By integrating real-time communication, order tracking, and role-based access, the system improves transparency and reduces manual work involved in traditional construction management. The application also provides vendors with opportunities to reach more customers and manage their services efficiently. The proposed system aims to simplify construction logistics and provide a reliable and organized digital solution for both buyers and vendors.

Key Words: Construction management, Mobile application, Vendor management, Firebase database, Android development, Digital logistics.

1.INTRODUCTION

The construction sector is an important part of infrastructure development, but managing materials, transportation, and vendor communication often becomes complicated for individuals building their own homes. In traditional construction processes, buyers usually depend on local contacts, agents, or word-of-mouth recommendations to find material suppliers or vehicle services. This method often leads to delays, price confusion, and miscommunication.

To overcome these problems, Build Connect has been developed as a mobile application that provides a direct connection between buyers and vendors involved in construction activities. The application allows users to search for vendors, communicate with them through chat or call features, and book services such as material delivery or vehicle transportation.

Another important feature of the system is real-time order tracking. Once an order is placed, buyers can monitor delivery progress and maintain records of their transactions. The application also includes features such as order history, notifications, and vendor profiles to ensure transparency in the system.

Build Connect not only helps customers but also provides a digital platform for vendors to expand their business reach. Small-scale vehicle owners and material suppliers can register their services and interact with potential customers easily. Overall, the application simplifies construction management and improves communication between all stakeholders involved in the process.

2. LITERATURE REVIEW

The construction industry is gradually adopting digital technologies to improve operational efficiency and reduce delays. Several studies highlight the importance of digital platforms in improving coordination between different participants involved in construction projects.

Research suggests that mobile applications can significantly reduce manual work in construction logistics

by enabling real-time communication and service tracking. Buyers can place orders and monitor deliveries directly through mobile devices, reducing the chances of miscommunication.

Online platforms connecting buyers and vendors also help improve trust in business transactions. Features such as order history, verified vendor profiles, and rating systems provide transparency and help users choose reliable service providers.

Another important aspect highlighted in literature is user-friendly design. Mobile applications with simple interfaces and organized features increase usability and encourage adoption among users with different levels of technical knowledge.

These studies support the idea that a digital platform like Build Connect can enhance communication, improve supply chain management, and bring efficiency to construction operations.

3. PROBLEM STATEMENT

In many construction projects, especially small-scale residential construction, individuals face significant challenges in managing logistics such as material supply and transportation services.

Buyers often depend on local vendors or middlemen to arrange construction materials or vehicles. This process is time-consuming and lacks transparency. Miscommunication regarding delivery time, pricing, and availability often leads to project delays and additional expenses.

On the other hand, vendors also face challenges in reaching genuine customers. Small-scale vehicle owners and material suppliers mostly rely on traditional marketing methods such as word-of-mouth promotion, which limits their business opportunities.

There is currently no centralized digital platform where buyers and vendors can interact directly, manage orders, and track deliveries efficiently. Therefore, a mobile-based system is required to bridge this communication gap and streamline construction logistics.

4. IMPLEMENTATION

The Build Connect application was developed using Android Studio as the development environment. The application interface was designed using XML layouts, while Java was used for implementing application logic.

Firebase services were integrated into the system to handle authentication, real-time database management, and storage. The application supports two types of users: buyers and vendors. Each user type has a separate dashboard and set of functionalities.

Buyers can browse vendor services, place orders for materials or vehicles, and track delivery progress. Vendors can manage their profiles, respond to orders, and update delivery status.

The application was tested on multiple Android devices to ensure smooth performance and reliable data synchronization.

5. METHODOLOGY

The development of the Build Connect application followed several stages:

Problem Identification
Identification of communication gaps between buyers and vendors in construction activities.

Planning
Selection of features such as login system, dashboards, order tracking, and communication features.

UI/UX Design
Designing simple and user-friendly interfaces for both buyers and vendors.

Frontend Development
Implementation of layouts using XML and user interaction components.

Backend Development
Integration of Firebase services for database management and authentication.

Testing
Manual testing on Android devices to verify functionality and performance.

Deployment
Generation of APK file for application distribution.

6. STACK USED FOR SOFTWARE DEVELOPMENT

The Build Connect application was developed using modern mobile development technologies to ensure efficient performance and user-friendly functionality. The frontend of the application was developed using the Java programming language along with XML for user interface design. Java was used to implement the application logic, while XML helped in designing responsive and structured layouts for different screens such as login, dashboard, and order management.

For the backend implementation, Firebase services were used to manage data and authentication. Firebase Realtime Database was utilized to store and synchronize application data such as user details, orders, and service updates in real time. Firebase Authentication was implemented to provide secure login and registration for buyers and vendors. Additionally, Firebase Storage was used to upload and store images, documents, and other media files related to the application.

The application was developed using Android Studio IDE, which provides an integrated environment for coding, debugging, and testing Android applications. The Gradle Build System was used for project building and dependency management, ensuring smooth compilation and library integration. Furthermore, Material Design components were applied to create a modern, consistent, and visually appealing user interface for better user experience.

7. ADVANTAGES OF THE APPLICATION

1. Direct communication between buyers and vendors
2. Real-time order updates
3. Simple and user-friendly interface
4. Secure authentication system
5. Reduced manual work
6. Efficient management of construction logistics
7. Scalable platform for future enhancements

8. HARDWARE AND SOFTWARE REQUIREMENTS

Hardware Requirements

- Processor: Intel Core i5 or higher
- RAM: Minimum 8 GB
- Storage: 256 GB SSD
- Android smartphone for testing

Software Requirements

- Android Studio
- Firebase services
- Postman API testing tool
- XAMPP server environment

9.OUTPUT SCREENS

10. TEST CASES

Test Case 1 – Login Test
Verify that users can log in with valid credentials.

Test Case 2 – Invalid Login Test
Ensure the system displays an error message for invalid credentials.

Test Case 3 – Place Order Test
Verify that buyers can successfully place orders.

Test Case 4 – Communication Test
Check real-time messaging between buyers and vendors.

Test Case 5 – Delivery Status Update
Verify that delivery status updates correctly.

11. CONCLUSION

The Build Connect mobile application provides an efficient digital solution for managing construction logistics. The system connects buyers and vendors on a single platform, enabling better communication, transparent transactions, and real-time service tracking.

By reducing manual coordination and improving order management, the application enhances overall efficiency in construction activities. The platform also provides vendors with increased business opportunities and helps customers find reliable services easily.

Future improvements may include online payment integration, vendor rating systems, and AI-based service recommendations.

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